

Algorithms and Regolith Erosion Models for the Alert Code, Phase I

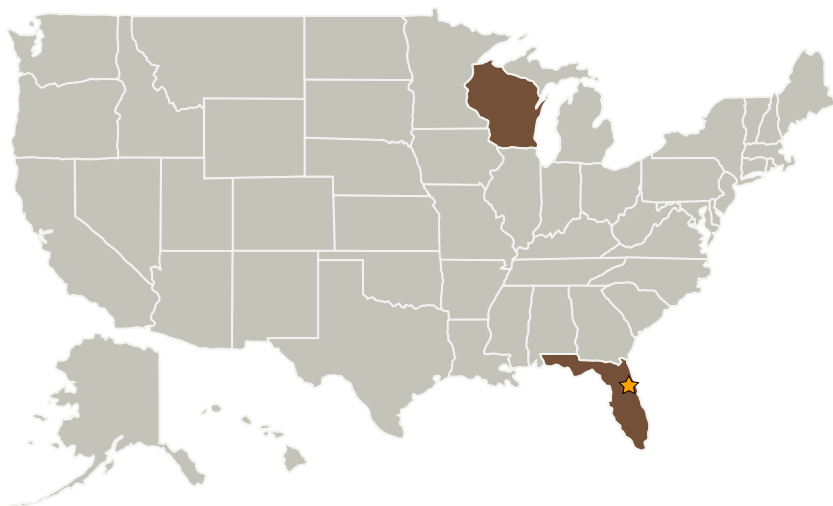
Completed Technology Project (2009 - 2010)



Project Introduction

ORBITEC and Duke University have teamed on this STTR to develop the ALERT (Advanced Lunar Exhaust-Regolith Transport) code which will include new developments in modeling of regolith erosion and entrainment as well as plume transport with full mass and momentum conservation. The Plume is handled in a Vlasov formalism with drag force on dust grains, dust equations of motion are solved over a size spectrum. Because of its significant gravity and lack of atmosphere landing on the Moon's surface must involve impingement of the rocket plume directly on the Lunar regolith. The experience in the Apollo landings, both from the perspective of the astronauts viewing surface conditions during decent, and the effects on the exposed surfaces of the Surveyor 3 from the nearby landing of Apollo 12 have alerted us to the importance of good modeling of rocket exhaust plume regolith interactions.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Transitions	2
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Orbital Technologies Corporation	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Madison, Wisconsin

Primary U.S. Work Locations

Florida	Wisconsin
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Project Transitions

 **January 2009:** Project Start

 **January 2010:** Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.4 Vehicle Systems
 - └ TX09.4.5 Modeling and Simulation for EDL